

T2-weighted MRI signal intensity of pituitary adenomas in acromegaly correlates with the response to primary medical therapy with somatostatin analogues

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Introduction: GH-secreting pituitary adenomas can be hypo-, iso- or hyperintense on T2-weighted MRI sequences. We observed that GH-secreting adenomas differ in their presentation and response to somatostatin analogues (SSA) depending on their T2-intensities. We conducted the current multicenter study to validate these results in a large population of patients with acromegaly that received SSA as primary monotherapy.

Method: Acromegaly patients primarily treated with SSA for at least 3 months were included in the study. Hormonal, clinical and general MRI assessments were performed and the data were centralized. In addition, ROI measurement of the adenoma, normal pituitary tissue and temporal grey matter was performed. A ratio between the adenoma ROI and that of the reference tissues was calculated in order to correct for inter-exam variations.

Results: 106 acromegalic patients were included. Of these, 76 were T2-hypointense, 14 iso- and 16 hyperintense at diagnosis. SSA treatment duration was similar in the 3 groups. T2-hypointense adenomas had a better response to SSA treatment. The response correlated with the calculated ratio

of T2-intensity. The lower the T2-weighted intensity, the greater the decrease of random GH ($p<0.0001$, $r^2=0.49$), IGF1%ULN ($p=0.0003$, $r^2=0.113$) and adenoma volume ($p<0.0001$, $r^2=0.378$).

Conclusion: T2-weighted signal intensity of GH-secreting adenomas correlates with the response to SSA primary treatment in acromegaly. This information could help in initial management decisions, as the information is available at the baseline diagnosis. Routine use of pituitary adenoma T2-weighted signal intensity on MRI could be useful in acromegaly assessment and management. Further studies are underway to explain the molecular mechanisms underlying the behavior of adenomas with different T2-weighted signal intensities.